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DISEASES *of the* NERVOUS SYSTEM

A Practical Journal on Psychiatry and Neurology

AUGUST
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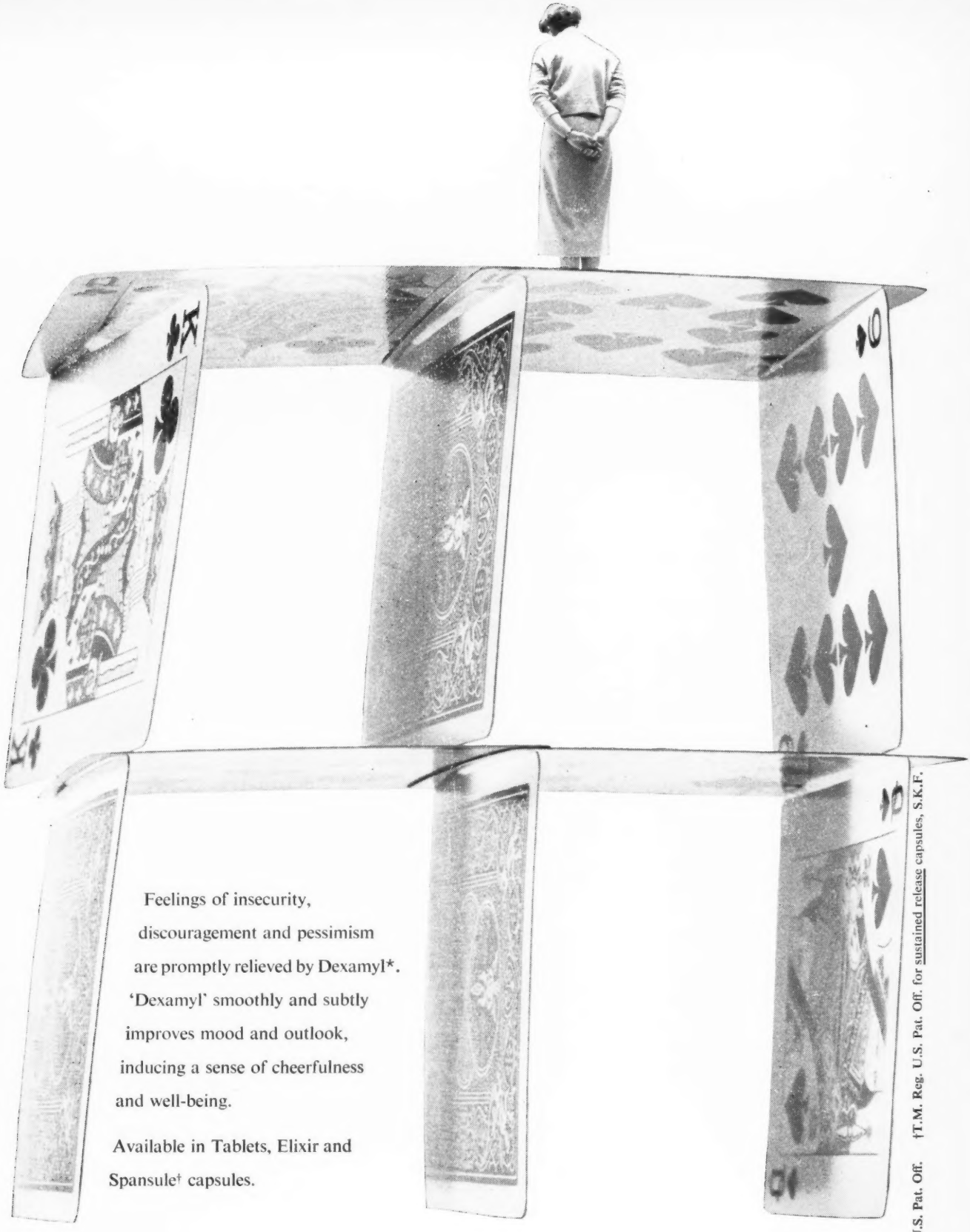

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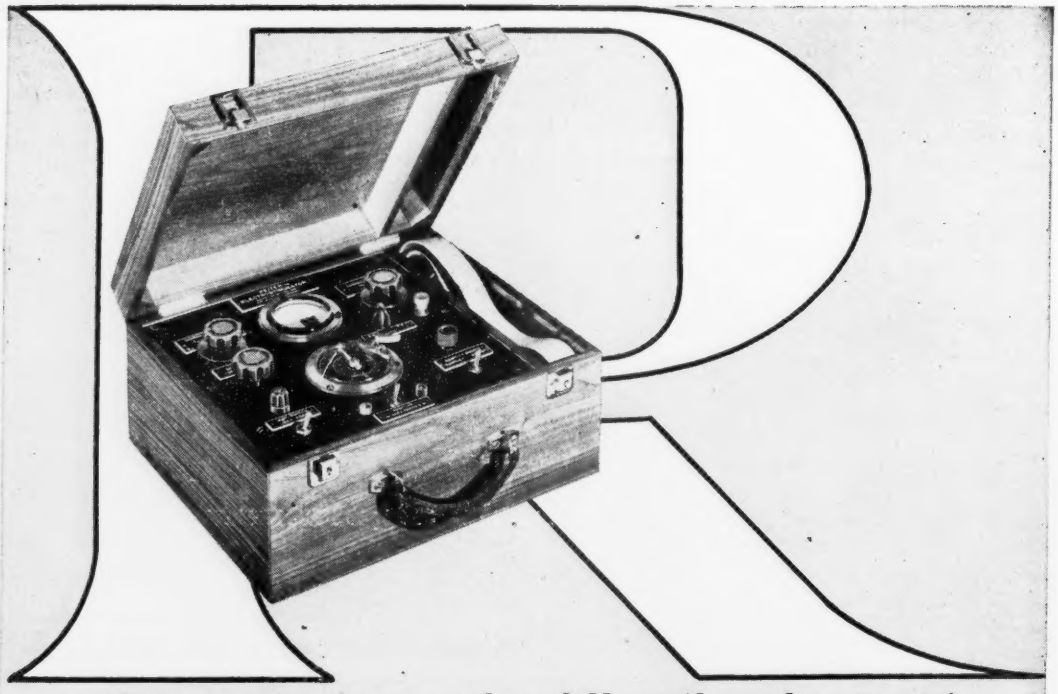

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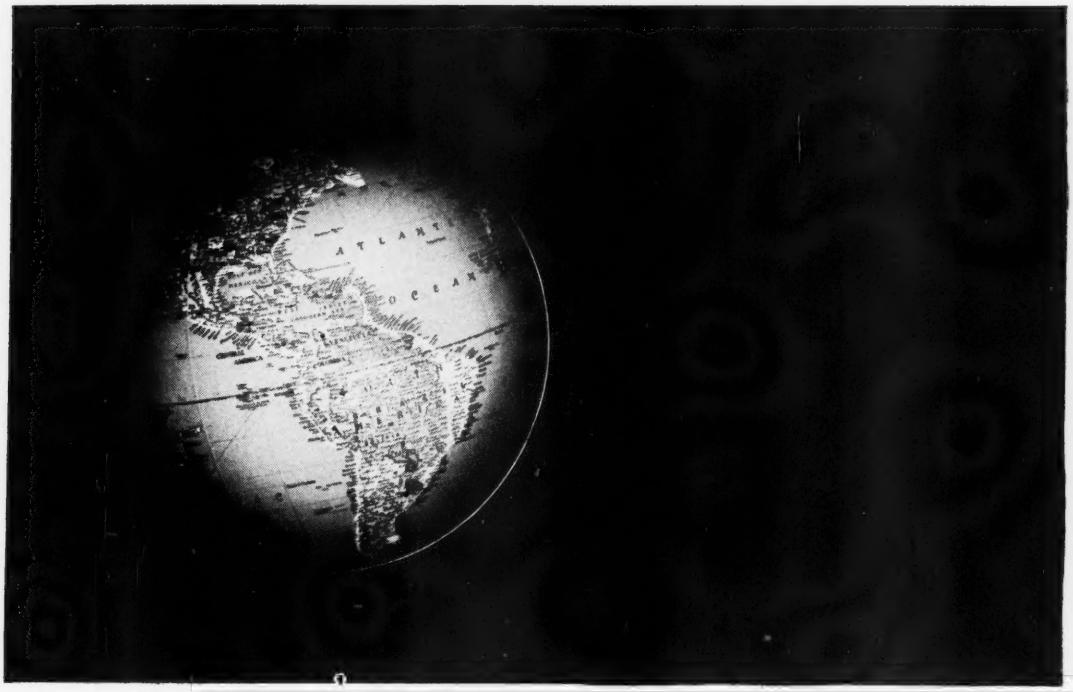

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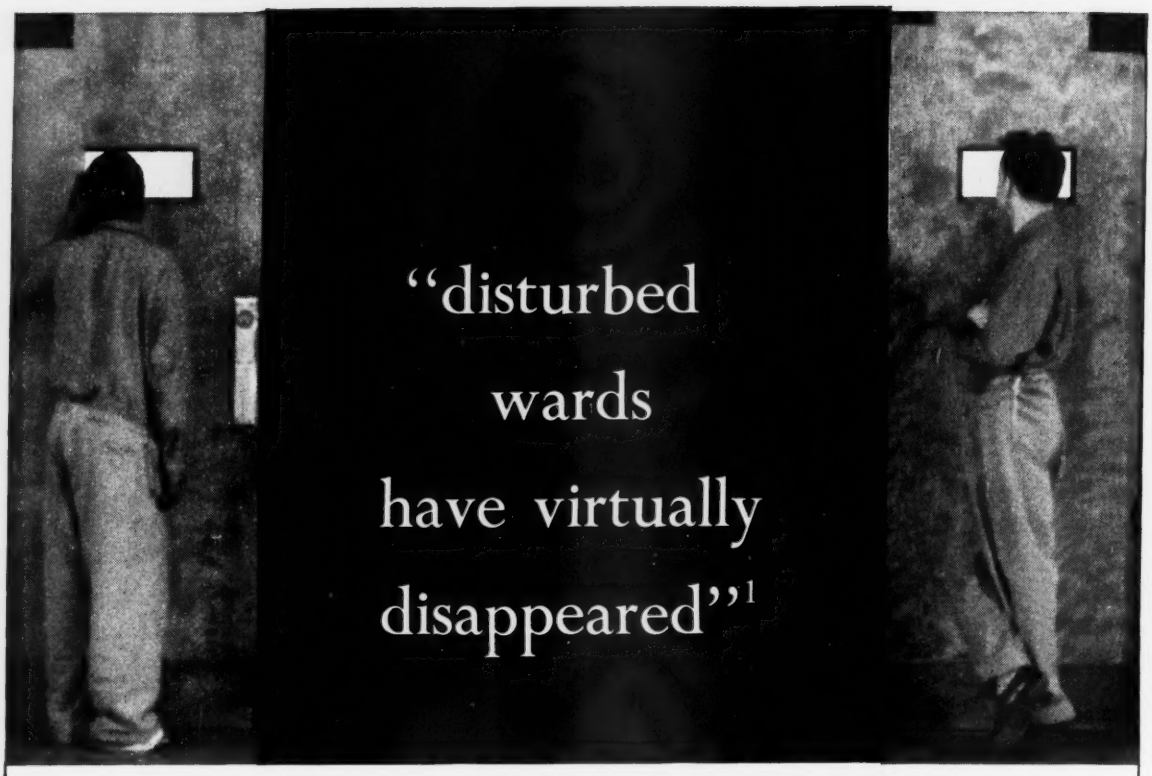

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DISEASES *of the* Nervous System

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Constitutional Aspects in Psychiatry of Poor Readers

WILLIAM CALVIN BARGER, M.D., RUTH LAVIN, M.A., and
FREDERICK E. SPEIGHT, M.A.

We are presenting a series of cases of poor readers who did not have that facile faculty of bridging axial deviations because of, we believe, the existence of a mixed dominance. We believe this to be a constitutional and not an emotional cause of poor reading in many severe disabilities, and that this constitutional condition, often referred to as a mixed laterality, is a much more prevalent cause, according to the data we have collected, than was heretofore suspected. In one New York City school area 80 per cent of poor readers were found to have a mixed lateral dominance. In the New York City Summer School Reading Centers, 1955, 33 to 65 per cent of poor readers showed a mixed lateral dominance. I believe Fernald found some of her most resistant reading cases to have a mixed dominance.[1] Happily, we also offer a solution for the correction of the poor reading condition in the pupil with mixed dominance, and draw some supporting conclusions therefrom for review. Because certain other and well-recognized constitutional aspects of poor reading are relatively easily identified, we shall not dwell upon them. They include gross physical defects in the refraction media of the optical apparatus, brain damage, true feebleminded-ness, poor nutritional states, degrees of impairment of auditory acuity, etc. These are features to which physicians are constantly alert. It is the opinion of some ophthalmologists that moderate refractive errors are unimportant and

"slight myopia may even be helpful. Muscle imbalance or crossed eyes with a single good eye, variations of image size between right and left eye, and abnormal eye movements are irrelevant."[2]

"All beginners tend to confuse left-to-right letter sequences for a time. This habit is generally outgrown but in some instances will persist as a specific reading disability, termed abnormal spatial confusion. Letters are transposed. . . . Short words are reversed. . . . Writing and spelling may also be deficient. Pronounced disability may result in upside down writing and drawing or in mirror writing. Visual recall is also defective . . . what has just been seen is not recalled. The fault is more common in boys and is often associated with left-handedness or ambidexterity. Intelligence is average or above. . . . The youngster who fails in reading may do exceptionally well in subjects such as arithmetic where printed words need not be recognized."

Further, from the same observer, "If the fault is neglected, many children are treated as mentally deficient . . . acquire secondary disorders as stuttering and emotional behavior."[2,3]

A careful review of the literature covering the past two decades reveals the extent to which the problem of laterality and its relationship to reading has been investigated. On the one hand, the studies of Dearborn,[4] Eames,[5] Selzer,[6] Monroe,[7] Harris,[8] and others show that there is more than a casual relationship existing in the confusion of dominance and poor reading. Other results such as obtained by Gates and Bond,[9] Hildreth,[10,11] and Wolfe,[12] indicate that confusion in dominance is of minor importance to the question. A third point of view expressed is that reading and writing reversals which can occur in mixed functional dominance cases have an emotional basis.[13] Some of the conflict is possibly due to difference in the types of tests used for dominance, in the number of cases involved, or in other variable factors. More of a relationship between laterally and reading disability is found in individual clinical studies than in reports of groups. Perhaps this is because usually the more severe cases are referred to clinics.[8]

We wish to reiterate that reading difficulties of primary emotional origin, or of so-

Read at the annual meeting of the American Psychiatric Association, Chicago, 1956, by Dr. Barger.

cio-familial etiology described by Fabian,[14] are not within the scope of this paper on the constitutional aspect of the subject regarding mixed lateral dominance.

It may be postulated that an area in the human cerebrum in the parietal lobe of the dominant side, which is near the angular gyrus wherein reading facility lies, and which is termed an area for body orientation (up-down, right-left) is of prime influence in the development of the awareness of axial directions in reading. Area 39 in Brodman's classification system of brain topography (von Economo's parcellation of the human cortex is preferred by Jasper and Penfield) is of "new" importance in man and does not exist in lower animals.[15,16] Consider the neuro-anatomical position of the area for body orientation: surrounded by such cerebral cells as superintend sentence understanding, word understanding, individual consecutive action, name understanding, visual recognition, visual memory, writing, reading, and constructive action. This architectonic area of our sense of axial direction, situated in the middle of the literary constellation of the brain, would hardly have been so placed unless it served a function in the orientation of the constellation. This proposal differs from Orton's belief that a successive, alternating striving of each of the two cerebral hemispheres occurs in an effort to achieve and maintain the solitary dominance so necessary in literary function, that the confusion is accompanied by strephcsymbolia, and that this mechanism was of prime importance in literate function failure.[17]

According to Nielson, the major reading area has a double function. It not only serves in the recognition of printed words, but also in their revisualization.[18] Failure in word memory as exhibited by poor visual recall of words has also been observed by Sinclair.[19]

We leave to the neuro-microscopists any detailed debate on theories, and proceed to show our battery of successful cases treated on the body-orientation basis utilizing a mirror by which the material to be taught and read is reviewed by the pupil as an inverted image with certain reversals of letters also appearing in the mirrored image. Note again that the vertical axis is inverted. This requirement when employing the mirror had been heretofore overlooked.

Our tests for mixed dominance are not elaborate. Many are extant (Albert Harris, e.g.)[20] We employ handedness, as writing and throwing, eye by tube and aperture, step off, kicking, turning direction, family history of laterality different from the pupil's and the thumb fold.

The thumb, because of the number of cells (approximately ⅓ of those of the hand) its representation superintends in the motor cortex of the brain, and in the thalamus, is undoubtedly a more important lead part in the physiology of the anatomy of the hand than we have heretofore believed. When the hands are clasped with digits interlaced, the potentially dominant thumb is on top of the other. The subject realizes at once which thumb feels more "natural" and comfortable atop the other. I have used, e.g., the left thumb fold as a clue to unresolved dominance in many poorly reading pupils who used the right hand exclusively.

The Mirroreading* Board[30] at which the pupil is seated is an accurately made device consisting of a properly angled mirror and an appropriately placed barrier. The latter conceals the actual reading material taught by the Mirror Technique.[30] The pupil learns from the inverted image of the material in the mirror.

During the year 1954-55, two clinics were set up in conveniently located schools to allow children from neighboring schools to be transferred for service with Mirror Technique. One of the authors (Barger) served as consultant psychiatrist, and the services of the two district psychologists, Frederick E. Speight, and Helene Lent were available at assigned times. The framework of learning was rather ideally controlled. The parents taken into confidence, cooperated immeasurably. They were relieved at not having been the cause of some emotional difficulty which was erroneously assumed previously to be blocking their child's reading.

In the previous year 1953-1954, one of our major findings in experimenting with the Mirror Technique had been the ability to identify children with mixed dominance by the Reading Readiness Test at the primary level. Although able to pass the concept part

of the test, they were unable to match the word symbols in the second part. Using this finding, a group of children with normal intelligence or above who lacked word matching ability, and who had not responded to the classroom methods of teaching were taken for instruction after laterality tests were administered. After a short time with Mirroreading* ranging from 2-4 months, all these children were returned to the classes, and were capable of continuing their progress under normal teaching methods. One of these children was able to retain 25 words after one session of teaching in the Mirror.

Another group of six pupils from the 3rd grade showed comparable results during the same period of instruction with the Mirror. Two of the children obtained the highest scores on the New York City-Wide Test in Reading in May 1955. A conclusion to be noted here is that identifying the children at these early grade levels and using the technique with them is economical from two standpoints. The gap in the reading disability is not so extensive, and the secondary emotional involvements concomitant with failure are not so deeply rooted.

The children in the classes higher than the 3rd grade all showed outstanding gains. The high spot was reached by a child who gained three grades in five months of instruction in the Mirror. The savings in terms of tempers, teachers' time, and taxpayers' funds are not to be overlooked. Equally important, the pupils have retained their new reading facility on follow-up.

The 103 cases serviced throughout the district included children with I.Q.'s ranging from 85 to 143 and represented all types of socio-economic areas. Only two children failed to show adequate progress and were referred for further examniation. Later reports indicated neurological involvements of collateral aphasic nature.

The clinics were continued during the school year 1955-56, and the same pattern of success has been observed. Over three years we have had approximately 300 cases who received this individualized reading service. The altogether prompt and definitive improvement shown when the diagnosis of mixed dominance is correct and uncomplicated has warranted extension of the project in the New York City school system. The data will be added to the mounting list of children who have been helped to overcome a serious reading disability by the Mirror Technique.

In the beginning we checked numerous sample cases with the Betts binocular machine[21] found no significant aberrations. Kennary, Rabinowitch, and Wexler report no relevant difference between the amount of abnormality in the electroencephalogram, and either cortical dominance or ability to read.[22] This would seem to rule out organicity as a factor.

In the effort to determine the effect of reading in the Mirror on the fusion of the eyes, the Eames Eye Test was administered to a sampling of pupils. Results show that the fusion after the session with the Mirror corresponded exactly with the fusion before. The children show no apparent signs of fatigue when the focus is comfortable and the lighting adequate.

Many children had been under intensive remedial instruction by experienced and expert tutors for as much as 2½ years; kinesthetic methods, tactile methods, directional methods, etc., had been employed, but pupils were given up because of little progress. There had been concomitant psychotherapy in a number of the cases, without avail. When the Mirror Technique was introduced, many of the same children previously unproductive seemed to have the scales struck from their reading eyes, progressed under the Mirror Technique, and were able to return to their grades or to show great improvement. These children, therefore, served as an ideal experimental control.

If their disability had been due to organic causes, it would have been irreversible; if it had been due to psychogenic causes, the expert tutoring and therapy should have cured them. We therefore postulate that the condition is of neuro-physiological origin, not organic, and not emotional.

Because of the frequent history of sinistrality in the family, the further impression of a genetic origin was suggested. Handedness and lateral dominance would appear to have a deeper determinant in genetics than

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is found in only custom, chance, and psychogenics.[23]

"Clinical observation and motion picture analysis have shown that there is a growth principle of functional asymmetry that is innate. This is abundantly illustrated by the spontaneous tonic-neck-reflex behavior of the normal infant in the early months. Handedness is not a simple trait, but must be regarded as a focal symptom of the current status of an everchanging action system, which, nevertheless, displays consistent symmetry and asymmetry trends over a long reach of growth. Data were assembled for 19 children, in whom the dominance during early infancy as ascertained by motion picture analysis was compared with the dominance shown in the cinema records at 1,5, and 10 years. In 14 of the 19 the right or left face direction of the tonic-neck-reflex was definitely predictive of later handedness. In five of the latter, handedness was ambiguous or contradictive. There were four in whom left-handedness was correctly foretold by a dominant left-tonic-neck-reflex in early infancy."[24]

The predominance of boys with reading difficulty, although explained on a sociological basis, could also be explained on a genetic basis in those with mixed dominance.

It is important to note that with the Mirror an internalized physiological adjustment takes place to the mixed laterality, sometimes after several lessons, in other cases after several months although externalized function does not shift. This internalized adjustment comes as automatically as the babe in the crib learns that up is down and right is left for gross vision when the biconvex lens of his new-born eyes registers objects like a camera; the memory of adjustment to topsy-turvy is lost before conscious recollection is a reality. The reading pupil, once this adjustment is made, can relinquish the use of the mirror. Mirror phenomena are not new,[25] but the method of using inversion of the vertical axis of the print in the mirrored image, and the use of the mirror as a teaching instrument are.

It is important to add that the pupil must accept the necessity of using the Mirror for a while, and want to learn to read. The poor reader with mixed dominance who does not improve with the Mirror should have further neuropsychiatric study in case some other constituent of the language-arts constellation is affected, possible in an aphasic manner, as spatial sense, spelling ability, manual motor agility for writing, perception deafness, or speech fault.[26] Poor spellers frequently can have a degree of conceptual aphasia. The relationship of reading within the literary constellation, of mixed functional dominance, and of aphasia warrants further future interest. Reading facility and the unilateral dominance necessary for it[27] are lately acquired evolutionary capacities, and hence the more easily susceptible to dysfunction occasioned through ontogenetic or phylogenetic origins.[28]

Because the Mirror Technique has neuropsychiatric implications, the use of it should be restricted to situations where all three of the following conditions prevail:

1. Persons trained in employing reading techniques; these techniques include all eclectic necessities and skills but are used in the Mirror.
2. Situations having as a supervisor an informed person in psycho-educational matters who can perceive any difficulties in the pupil's progress due to related handicaps, and can advise if they are minor, or report them if they are major.
3. A neuro-psychiatrist with a knowledge of the field of cerebral functions as a final consultant on particular cases which offer undue difficulty, as well as supervision for the entire clinical aspects of the program.

In short, the Mirror Technique is intended to be an added implement in the armamentarium of the expert reading teacher, or other similarly skilled professional, for use with the pupil whose reading difficulty is based on a mixed lateral dominance. It is not for use by untrained persons, just as only x-ray experts can adequately handle the interpretation of x-rays, and the constant Rorschach interpreter can best appreciate the nuances of that test.

It is not the purpose of this paper to expand on the details of the Mirror Technique in use. This paper aims to present only the idea, and the results which have been obtained by the proper use of the technique. It should be mentioned, however, that failure to profit from its use when the presence of mixed dominance is established, calls for the neuro-psychiatrist to check for related conditions particularly in the field of aphasia[29] as these can apparently spill over into the reading area. Also, the trained person comes to recognize what the authors observed laboriously, the signs when the pupil is ready to relinquish the use of the mirror.

There is always the concern that the pupil might continue too long, and precipitate a confusion of the confusion. One of the authors (Lavin) observed that practically all children have mirror reading facility until they reach the achievement level for fourth grade reading, or just below.[29] The unadjusted mixed dominance child, however, cannot conveniently reach even that level without assistance in internalized adjusting to the mixed laterality. When mastery of the fourth grade material becomes possible, the pupil loses the power to read in the mirror. The teacher must constantly be on the lookout for the older child who wants to leave the mirror too rapidly, and feigns inability to employ it longer. It bears repetition and will be evident from these remarks that a skilled person under supervision only should employ the technique, and both these persons should have access to the clinical service of the neuro-psychiatrist. There are expected secondary emotional factors around the core of mixed lateral dominance which usually resolve as reading improves. A child with a primary emotional block, rather than with a constitutional impediment in reading, should be handled by the psychiatrist on the psychotherapeutic level . . . another example of the need for a clinical person to aid in diagnosing the pupil who has a reading disability.

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Results of Lobotomy Operations

G. DONALD NISWANDER, M.D., WILLARD E. CUMMINGS, M.D.,
KERRY B. OAKEY, R.N., and EARL K. HOLT, M.D.

A follow-up study of 92 consecutive patients who have received lobotomy operations has recently been completed at the New Hampshire State Hospital. The operations were performed between August 26, 1948 and December 14, 1954. This paper reports the results found in this follow-up study program during December 1955.

Method of Study

The selection of patients for the lobotomy procedure was approved by the entire medical staff of the hospital on the basis of two factors. First, that the patient manifested chronic disturbed behavior or his clinical course indicated that a chronic disturbed state was developing; and second, some features of the patient's responses were considered to represent a residual potential for improvement, e.g., good but unsustained response following electroconvulsive therapy. All patients received the McKenzie technique of operation when they were lobotomized. Twenty-two of the patients were men and 70 were women. At the time of the study 55 patients were still in the hospital and 36 were outside the hospital. Only one, a woman, had died from heart disease up to the time of the study. However, her degree of psychiatric improvement is included in this report. The age at the time of the operation varied from 12 to 67 years with a mean age of 35 years. The duration of the present episode of illness prior to operation varied from one month to 30 years, with a mean duration of 9.5 years. In the psychotic patients the date of duration of the present episode of illness was taken after the onset of psychosis without regard to previous symptomatology.

Information for this follow-up study was derived from two sources. In the group of patients who were out of the Hospital at the time of this report, all were interviewed who were available by two of the authors, W.E.C., clinical psychiatrist and/or K.B.O., a member of the Hospital Social Service Department. In addition information was obtained from one or more relatives. Two patients were out of the state and not available for interviews. At last contact, before leaving the State of New Hampshire, excellent social adjustments had been maintained by these two. In the group of patients who remained hospitalized at the time of the study the information was obtained from two persons who had known the patients over a period of time. These two people were one of the hospital staff psychiatrists and a member of the nursing staff. In most instances there was general agreement as to the effects of the operation without the psychiatrist or nurse knowing what the other had reported.

Table I lists the diagnosis of the patients included in this series of lobotomy patients.

TABLE I—DIAGNOSIS OF PATIENTS

Schizophrenia, all types	60
Manic-Depressive, all types	13
Involutional Psychotic Reactions	6
Psychoneurosis, all types	5
Other conditions	8
	92

To evaluate the results of the lobotomy operations each patient's condition was periodically classified into three groups:

Group A—out of the Hospital
Group B—improved in the Hospital
Group C—unimproved in the Hospital

From the Department of Psychiatric Research, New Hampshire State Hospital, Concord, New Hampshire.

Results

Table II demonstrates the status of the patients at yearly intervals following operation expressed as actual numbers falling into Groups A, B and C, and shown as a percentage of the cases available for comparison at each time unit.

Table III records the changes in the patients' status from one year to the next; 70% or more showed no change. The largest change, 30%, was from the first to the second year. During this second year 21% improved, as contrasted with 9% who became worse. In subsequent years improvements in the group largely offset relapses.

There were no deaths resulting from the lobotomy procedures. As noted, one patient died during the first year following operation from rheumatic heart disease, after having improved psychiatrically.

Three patients had one isolated grand mal convulsive seizure each within the first four months post-operatively. Two patients had three seizures each during the first four months post-operatively, with none since that time. Only two patients have required anti-convulsive medication for grand mal seizures since operation. One of these had epilepsy at the time of lobotomy and since operation has required smaller doses of anti-convulsants for adequate control.

TABLE II—ANALYSIS OF RESULTS

Yrs. Post-Lobotomy	Total No. Patients	Number of Patients			Per cent		
		A	B	C	A	B	C
1	92	37	34	21	40	37	23
2	75	32	25	18	43	33	24
3	58	22	20	16	38	34	28
4	32	12	12	8	37.5	37.5	25
5	13	6	4	3	46	31	23
6	7	4	2	1	57	19	24
7	3	2	1	0	66	34	0

TABLE III—POST-LOBOTOMY CHANGES FROM A TO B, B TO C, OR VICE VERSA*

	1-2 yrs.	2-3 yrs.	3-4 yrs.	4-5 yrs.	5-6 yrs.	6-7 yrs.
Unchanged	70%	87%	77%	79%	92%	75%
Down 1 step	7%	5%	10%	15%	0%	0%
Down 2 steps	2%	1%	0%	0%	0%	0%
Up 1 step	21%	6%	13%	6%	8%	25%
Up 2 steps	0%	1%	0%	0%	0%	0%

And one patient up one step (of 3 pts.) 7-8th yr.

*Percentages indicate ratio of changed cases to total number of charges. Some patients changed more than once.

Summary

On the basis of the selection of the patients, the over-all results of these 92 post-lobotomy operations indicate that three out of four patients benefited from the procedure. On an annual analysis, the majority of the patients were stabilized by the end of the second year, and in subsequent years, such real worsening, as was encountered, was offset by an equal number of patients who improved.

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Psychiatric Services in a Pediatric Hospital

A. H. CHAPMAN, M.D., LORAINE PILKEY, M.A.
and MARY JANE GIBBONS, M.S.S.W.

The development of antibiotics and advances in preventive medicine in the last twenty years have reduced considerably the pediatrician's case load. Infectious diseases that formerly occupied the major portion of his working hours are now handled by easily administered and highly effective antibiotics. The complications of infectious diseases, such as mastoiditis and empyema, are becoming clinical exceptions rather than daily problems. Better public sanitation and inoculation have long since emptied the wards of their lines of typhoid and diphtheria patients. Improved socio-economic standards and better nutrition are reducing the incidence of a wide spectrum of diseases, from rickets to rheumatic fever.

In the place of these formerly frequent and time-consuming problems the pediatrician is now faced with increasing demands for attention to the psychological and organic disturbances of the central nervous system. The emotionally upset child, the mentally deficient child, and the organic brain-damaged child are presented for attention.

The increased incidence of emotionally upset children is probably more apparent than actual. Problems, such as feeding difficulties, which were formerly classified as having some organic basis, cannot be so handled in an era when diagnostic procedures have become more definite. Behavior disturbances, formerly handled on moral and disciplinary levels, are sometimes presented by parents as medical problems; the public has increasingly come to feel that behavior disorders are, at least in part, the province of the doctor. There is a steadily increasing percentage of patients in pediatric practice to whom the only true service the doctor can render is to explain and listen.

The organic brain-damaged child, the cerebral palsied child, and the mentally deficient child no longer commonly die in infancy from pneumonia, septicemia and nutritional deficiencies. They live, by virtue of medical progress, and are presented as problems to the pediatrician and the pediatric hospital. Those who deal with children are confronted with a changing case load; the largest group of new problems lies in the field of the functional and organic difficulties of the central nervous system. From all appearances, the trend will grow as medicine progresses in the next decades.

In recognition of these needs there is a tendency to organize psychiatric teams within the structure of pediatric hospitals. This article deals with the organization, activities and scope of such a service; a review of the characteristics of 195 consecutive cases seen by our unit is presented. It is felt that these patients are characteristic of the case-load of a psychiatric team operating in a pediatric hospital, and will tend to give an over-all picture of the nature of this growing segment of pediatric practice.

The Organization and Activities of the Unit

Emotional problems of children are family problems; they are the product of disturbed parent-child relationships. Psychiatric services for children must therefore include resources to deal with parents; hence a psychiatric social worker is included in the clinical team. Children have limited capacities for talking and explaining themselves; consequently, the clinical psychologist with his battery of personality testing materials is essential. The other member of the clinical team is the psychiatrist, a physician with special interests and training in emotional problems of children. This is the clinical team that grew up in the child guidance clinic movement; the rationale for its continuation in psychiatric services in pediatric hospitals is equally valid.

When such a psychiatric unit is established in the hospital, it will be found that the volume of referrals will not permit a

From th Pesychiatric Unit, The Children's Mercy Hospital, Kansas City, Mo., affiliated with the Greater Kansas City Mental Health Foundation and the Department of Pediatrics of the University of Kansas School of Medicine.

classical child guidance work-up of the entire family structure; this would include interviewing the parents at length and several psychological sessions with the child, as well as the psychiatrist's evaluation of the child. Such an adherence to classical child guidance techniques would soon result in lengthy waiting lists and a small number of patients seen. The psychiatric team would cease to function as an integrated medical facility in the hospital and would soon find itself in a clinical corner functioning out of contact with the other clinics and the wards. The physicians in the hospital would tend to grow skeptical about a service which proclaimed its growing clinical importance, and was then unable to see patients, even for diagnostic help. A hospital is geared to give its diagnostic services, such as laboratory activities or specialty clinics, rapidly; if psychiatry alone stands with long delays, physicians will return to getting along without it, and the prime values both in teaching and patient services will be lost at the outset.

To avoid this the authors have set up a psychiatric screening service which sees all cases, except those referred for intelligence testing only. The child and parent, if outpatients, are interviewed separately by the psychiatrist in one visit; a diagnostic summary is dictated, outlining impressions and giving suggestions to the clinic physician on the general management of the problems involved. The screening is best done by the psychiatrist, who can better look at the case from the viewpoint of the referring doctor and can thus make suggestions which are practical and acceptable to the referring physician. It is important that the report from the psychiatric screening service be put into the medical record before the patient is seen on his next pediatric clinic visit; the reports must be concise, and in conventional medical language rather than esoteric psychiatric terminology.

Out of the cases which pass through the service, certain cases will thereafter receive a more extensive work-up by the complete clinical team. The choice of such cases will be determined by varied factors such as (a) how busy the psychiatric team is, (b) the interest or pressure of referring doctors, and (c) the necessity for further work-up for even a minimal understanding of some cases.

An important function of the psychiatric unit is to act as a clearing house for the referral of children and parents to any indicated psychiatric or social work services in the community. At times, for instance, after evaluation of a case, the most profitable procedure is to refer the parents to a social service agency for work on their marital problems. Selected cases, where there is good motivation for treatment, may be referred to available child guidance clinic facilities. Selective and judicious use may be made of county welfare offices and other similar agencies. In some situations recommendation for institutionalization constitutes the only possible referral. Referrals must, in our experience, be made sparingly. The number of disturbed children and upset parents seen in a psychiatric diagnostic service usually far exceeds the capacity of community services to deal with them. The best motivated, those with the best prognosis, or the most desperate cases, are those referred.

As a rule the functions of the psychiatric unit will be diagnostic and counseling. Extensive interview treatment can go on only where personnel is generously available. Treatment by the psychiatric team will fall into several broad categories; (a) counseling of parents and interpretation to them of the diagnostic status of the child, and recommendations for treatment that will bring about the most satisfactory solution of the problem, (b) interpretation of psychosomatic aspects of a medical condition, (c) some limited exploration and interpretation of parental attitudes, (d) supportive work, or limited interpretative work, with in-patient children, (e) advice to referring physicians on the most judicious management of a case, (f) occasional prolonged interview therapy of parents and child, depending on available time and personnel.

Another important function of the psychiatric unit is participation in a training program for graduate and student nurses. This is an avenue for approaching the mental hygiene aspects of nursing routines and general management procedures in the hospital. Orienting ward personnel to the prob-

lems of a therapeutic mental hygiene milieu is a central function of the psychiatric unit.[1] Members of the unit can participate in discussions of the best way of admitting children on the wards. The area of the mental hygiene of hospitalized children and ameliorating the stress of the hospital experience for the child, represents a significant area for activities of the unit.[2]

To plan any special wards for the treatment of psychotic or very disturbed children should be the last step in the development of psychiatric services in a pediatric hospital. Such wards are expensive, require much carefully supervised personnel and take up a great deal of time. It is our feeling that psychitric services in a pediatric hospital should be firmly established and accepted before special psychiatric wards are attempted. The need for the latter is great, but they can be successful only when generously staffed, well financed, and built on the basis of previously established psychiatric services.

Much future professional personnel of the community passes through a hospital. Interns, residents, and student nurses are the community physicians and nurses of the future. One way to begin to meet the extensive mental hygiene needs of children in a community is to put good psychiatric consultation and teaching services in institutions through which professional personnel pass in their training period. This is probably the greatest basic function of a psychiatric unit in a pediatric hospital. The ward consultations, the many contacts with the house-staff and nurses, the availability of a psychiatric report in a clinic record to help a perplexed intern deal with a puzzling problem—these are subtle, pervasive, and important aspects of the unit's activities.

Survey of Cases Seen

What kind of cases are referred to a psychiatric team working in a pediatric hospital? A general picture of the types of cases seen may be obtained from a summary of final diagnoses of 195 consecutive cases. Official 1952 American Medical Association nomenclature of diagnostic terms is used.

Mental deficiency	42%
Personality and/or behavior disorders	26%
Psychoneurotic reactions	9%
Psychosomatic reactions	9%
No psychiatric pathology	10%
Schizophrenia	3%
Organic brain syndrome without mental deficiency	1%
	100%

The largest single group of patients consists of mentally deficient children who are referred for a definitive intelligence testing by the psychologist. These cases take up less time than other cases; hence, though they loom large in statistics of total number of patients they occupy only a small segment of the working hours of the psychiatric team. Intelligence testing is a basic service that the wards and clinics need in managing these patients. The referring physicians and nurses are in a much sounder position in working with the children when their specific I.Q.'s are known.

To get a more accurate idea as to how the psychiatric team spends its patient-service time, the final diagnoses are given on 113 consecutive cases seen for difficulties other than mental deficiency.

Personality and/or behavior disorders	44%
Psychoneurotic reactions	17%
Psychosomatic reactions	16%
No psychiatric pathology	16%
Schizophrenia	5%
Organic brain syndrome withont mental deficiency	2%
	100%

From these figures, it can be seen that the most frequent referral is for behavior disorders. The bulk of these children fall in one of the following groups: (a) adjustment reactions of adolescence or childhood, (b) schizoid children, (c) the passive-aggressive group of difficulties, which includes the overly aggressive disorders at one end of the scale and the passive children who inhibit their assertive feelings unduly, at the other end of the balance. Psychogenic enuresis is there classified under the type of personality disorder that is causing it.

In the psychoneurotic reactions, the majority are cases of conversion hysteria; a few obsessive-compulsive disorders and anxiety reactions are seen. The types of conversion hysteria seen were, in decreasing frequency, seizures, blindness, syncope, pain, and aphonia.

In the group of psychosomatic disorders, the largest group, 11 out of 17 cases, concerned the gastrointestinal system; included were cases of duodenal ulcer, ulcerative colitis, encopresis, psychogenic megacolon, vomiting, etc. We have been continually impressed with frequency of psychogenic gastrointestinal complaints in children.[3,4]

Sixteen per cent were classified as "no psychiatric pathology." These included (a) children referred for intelligence testing for administrative purposes, such as to qualify for aid from crippled children's funds and were found to be normal in intelligence, (b) cases where it was felt that the disturbance was in the mother mainly and the child was reasonably healthy, (c) children who were referred back to the pediatric clinic where organic causes of pathology were later found to explain the symptoms.

It is interesting to compare this group of patients with the case load customarily seen in a child guidance clinic operating outside a hospital setting. The differences consist of: (a) the much higher incidence of mentally deficient children seen in a hospital setting, (b) the greater number of children with psychosomatic disorders in the hospital group, and (c) the large number of children seen with conversion hysteria, a comparative rarity in the child guidance clinic. Generally speaking, the number of psychotic children seen in each setting tends to be about the same. Personality and behavior disorders form a large part of the patient load in both the hospital and the child guidance clinic settings.

Emotional Aspects of Hospitalization

There has been increased interest in the last decade in the emotional impact of a hospital experience on a small child. The large volume of research done in this field points to the fact that hospitalization, and especially surgery, can be an experience of the greatest importance in the emotional development of the child. Being separated from parents and introduced into a strange environment where the purpose and meaning of physically painful procedures is not clear, may be an intensely disturbing experience for a child. Much evidence points to the possibility that such an experience may have far-reaching consequences in the development of later psychiatric symptoms and characterological difficulties.

There is an extensive body of data on how the stresses in young children of hospitalization and surgery may be ameliorated. The psychiatric team can be of service to the hospital and its patients by helping to organize the activities and procedures by which the best possible emotional milieu may be created in the pediatric ward. This involves work on all levels, with the physicians, the nurses and the aides. Such procedures vary in scope, from the simple act of putting each child's nickname or commonly used name on the foot of his bed on a piece of adhesive tape so that each person may readily call him by the name he knows, to a reconsideration of entire routines such as admission procedures. The slow but progressive introduction of such attitudes and data into the hospital setting represents an extensive field for the collaborative efforts of the psychiatric unit and the hospital staff.

Summary

The development of antibiotics and better preventive medicine is resulting in a progressive change in the pediatric case load. Increasingly, the pediatrician is being confronted with the psychological and organic problems of the central nervous system. To meet this growing need, the introduction of psychiatric teams in pediatric hospitals is becoming more common. The organization, activities and scope of function of a psychiatric team in a pediatric hospital, are described. A survey is given of the clinical characteristics of a series of 195 consecutive patients seen by such a psychiatric unit.

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Effect of Perphenazine (Trilafon) on Modification of Crude Consciousness

N. L. MASON-BROWNE, M.A., M.B., CH.B., and J. W. BORTHWICK, B.A.

Since the recent warning of the Research Committee of the American Psychiatric Association against the indiscriminate use of the so-called "tranquilizing" drugs, and with the appearance of still more of these agents of even greater potency on the market, the necessity for controlled studies becomes urgent. It is necessary, as Stewart Wolf[1] has pointed out, that acceptable evidence of the efficacy of drugs be available before those drugs are prescribed. This paper presents the results of a preliminary clinical investigation into one of the newer agents which is stated to have a potency several times greater than chlorpromazine.

The reticular activating system of the brain stem as described by Moruzzi and Magoun[2] and by Jasper[3] is probably the principal site of activity of chlorpromazine. We consider that lesions affecting the ascending reticular activating system produce alterations in basic or crude consciousness rather than in specific modalities of consciousness.[4] Sulman and Winnick[5] believe that chlorpromazine has a suppressor effect upon the alerting mechanism and produces autonomic and endocrine functional changes through action on the hypothalamus.

A drug similar to chlorpromazine in its site and mode of action, but with several times its potential, should be capable of being given in effective doses small enough to minimize the risks of side effects. Such a drug given in a non-toxic dosage, and because it is similar but more powerful in its activity, should produce alterations of behaviour, emotion, and level of awareness, and thus confirm the importance of the mesendiencephalic alerting system in the regulation of general behavior.

Perphenazine (Trilafon) is an amino-derivative of chlorphenothiazine. It is similar to chlorpromazine and may be assumed to act principally upon the alerting system of the brain stem. Animal experiment demonstrates that its potency is five to ten times greater than chlorpromazine.

Ayd[6] found it useful in the treatment of anxiety in geriatric patients. He found side effects to be rare in doses of 30 mg. daily or less and such dosage was effective in the alleviation of symptoms.

This preliminary study of the drug was designed to test further its efficacy and to determine whether changes produced by it could reasonably be ascribed to action upon the reticular activating system. The difficulties of assessing the value of new therapeutic agents are manifold. Modern psychiatric therapy is triadistic. Similarly, any drug given to a patient has a three dimensional effect: psychological, social, and physiological. This study attempts to determine the specific pharmacotherapeutic activity of perphenazine by reducing or equalizing adjuvant influences, so far as that is possible. The methods used are such that they can be repeated in any mental hospital setting without the use of special equipment. It is considered that this is an essential, but all too often forgotten, prerequisite of clinical research.

Method

(a) Selection of patients: A sample of 75 chronic patients was used, consisting of 36 men and 39 women. Average age was 41.8 years (minimum 20 years, maximum 54 years). Average duration of hospitalization was 12.7 years (minimum 1 year, maximum 36 years). Chronic patients were chosen because of their availability and since they displayed a fairly uniform cultural stability and resistance to therapy. All the patients had been in hospital long enough to permit the assumption that changes produced were not due to fluctuations in the course of the illness, or to spontaneous improvement. All the patients displayed anxiety, over-activity, or were problems in nursing management, although they displayed these signs to varying degrees. It would be naive to suppose that the group was anything other than heterogeneous. It is frequently forgotten

that this applies to almost every group used in clinical research. All, however, had received one or more of the usual somatic therapies, with poor result, and all were considered to have a poor prognosis.

(b) The examiner: The senior author (NLMB) was the physician normally responsible for the care of all the patients. He personally tested all in ways to be described. The use of a single examiner tended to equalize the well-known effect of an examiner's personality characteristics and enthusiasm upon variations in clinical observations. The effect of a subject's conception of the examiner as an authority figure or not, or as an arbiter of discharge was also equalized as far as possible by retaining the testing in the hands of a single individual known to all patients. In this way also, the varying influences upon data of different observers of differing orientations was minimized.

(c) Setting of the study: The patients remained in their usual wards within the same building. This was held preferable to setting up a separate research unit for many reasons including the short duration of the study and the fact that it was thought better to leave patients in situations in which equilibrium had been established. The wards were fairly uniform in respect to physical conditions.

(d) Administration of the drug: The double blind technique was employed. It would seem unnecessary to emphasize that no clinical assessment of a drug can be considered valid unless such a method is used, but a welter of useless material continues to appear. The patients were divided into three groups of 25 persons each, labeled A, B, and C. Each consisted almost equally of males and females, and were matched as far as possible in respect to age. Group A received a 16 mg. placebo tablet three times a day. Group B received a 16 mg. perphenazine tablet three times a day. Group C received a 25 mg. chlorpromazine tablet three times a day. The tablets were exactly the same in size, shape, and color. Tablets were supplied to wards in uniform individual containers bearing a label which stated the patient's name only. Nurses and physicians were unaware of which patient was receiving which tablet. The key to the identification was held by the pharmacist and not revealed until completion of the study. A further seven female patients were later added to the study. These had been receiving large doses of chlorpromazine which had produced no changes. While on the trial, four of these patients were given perphenazine tablets and three received the placebo. Dosage was that indicated above. These seven patients were not submitted to testing as described below. The criteria of effects of drugs are not always measurable, and for that reason, as Wolf[1] has pointed out, blind placebo control is important so that inaccuracies of observation are randomized and lack of precision in quantifying data is equalized.

(e) Duration of trial: Drugs were administered daily by mouth for 30 days. For at least one week prior to start of medication, and following the end of the trial, no other medication or any other therapy, including psychotherapy, was given. Patients were, however, permitted to engage in any recreational, occupational, or other activities to which they were accustomed.

(f) Laboratory investigations: Routine urinary examinations, white blood count, and alkaline phosphatase tests were carried out on each patient immediately prior to starting medication and on completion of the trial.

(g) Nursing records: Nurses in charge of wards kept daily notes of the following items: blood pressure, temperature, pulse, respiration, frequency of micturition, bowel movement, nasal congestion, appearance of skin rashes or incidence of tremors or twitchings, presence of nausea, degree of restlessness, anxiety, tension, alertness, confusion, socialization and interest in self, and appearance or disappearance of insomnia. Finally, chief nurses were asked to summarize their opinion of the effect of the medication at the end of the trial. Nurses were asked to avoid giving patients included in the trial any increased attention, but this may have been unavoidable.

(h) Ratings: All patients were rated by the writer before the start and on completion of medication. The Wittenborn Psychiatric Rating Scale was used. The scale provides for the quantitative evaluation of behavior.

It is restricted to discernible behavior, is descriptive, and involves direct observation requiring little interpretation. These qualities are designed to minimize the effect of subjective bias or orientation on the part of the examiner. A rating procedure was chosen since it simplifies and objectifies clinical observation and recording. The acute anxiety cluster derived from the factorial analysis studies of Wittenborn[8] was used. This cluster consisted of 12 scales; 1, 3, 4, 13, 15, 18, 22, 23, 28, 38, 45, 47 each being composed of three or four statements variously weighted.

(i) Testing: Each patient was submitted to a battery of tests before the start and on completion of medication. In choosing tests the following principles were considered. Tests were sought which would give a quantitative objective estimation of attention, concentration, memory, learning, and of basic perceptual and motor function which did not require literacy to be performed. In addition, tests which involved emotional factors least, and in which the practice factor would be approximately equal were preferred. Tests involving special equipment, although preferable in many respects, were excluded since it is believed that all clinical investigations of this kind should be susceptible of easy repetition by other workers. Six tests were selected:

1. Tapping test: This forms one of the MacQuarrie tests for mechanical ability[9] originally designed to provide objective measurement of specific aptitudes. It measures speed of motor discharge and is influenced by tension and anxiety. The subject is presented with a regular series of printed circles of about ⅜ inches in diameter. After a short practice period and on the word "go" he is asked to place three dots in each circle as rapidly as possible. After 30 seconds he is stopped, and the number of correctly dotted circles is counted.

2. Dotting test: This test has the same derivation, function, and method of marking as the tapping test. A staggered series of circles of about 3/16 inches in diameter is presented, and the subject is required to make one dot in each circle. He is given 20 seconds for the test.

3. Digit symbol test: This was extracted from the Wechsler-Bellevue Scales. It is purported to measure learning and visual motor efficiency. The subject is presented with an unordered series of 75 numbers using the digits 1 to 9. Each number has a space below in which the subject is required to place a symbol associated with that number according to a scheme placed before him. After a short practice he is given 1½ minutes for the test.

4 and 5. Digits forward and digits backward tests: These tests were also extracted from the Wechsler-Bellevue Scales. They measure retention and immediate recall.

6. Porteus maze test: Gardner and his associates[10] found greater improvement after reserpine in maze scores than after chlorpromazine. Porteus[11] found that chlorpromazine resembled lobotomy in producing a marked drop in scores. The implications regarding the site of action of chlorpromazine and similar drugs are obvious and influenced the authors to include this test in the battery. It measures principally the subject's capacity for making a planned response to an increasing range of relevant stimuli. On completion of medication the test cards were presented upside down to minimize the learning factor. No qualitative scoring was done.

(j) Statistical procedures: Each individual's score was based upon the change from first to second testing. For convenience of interpretation, the tapping and the dotting tests were combined, since their derivation and function are similar. For the same reasons, digits forward and digits backward were also combined into a single score. Thus five separate scores were obtained for each individual subject under the headings: Rating Scale, Tapping and Dotting, Digit Symbol, Digit Span, Porteus Maze. An analysis of variance was made for each of the five separate scoring categories to determine significant variations between the placebo, perphenazine, and chlorpromazine groups. Where significant variations were discovered a t test was used to determine the source of variation. The point or level of significance was set at 5 per cent.

Results

These are summarized in Table 1 for the 75 patients who were tested. The statistical findings are summarized in Tables 2 and 3.

The perphenazine group was reduced to 23 when two patients developed untoward side effects necessitating their withdrawal from the study. One patient from each of the other two groups refused testing on completion of medication and were also excluded from the calculations. In the rating and in all the tests, with the exception of the Porteus Maze, patients treated with perphenazine showed the greatest change towards improvement, while those receiving placebo showed least change. It is of particular in-

terest that in the Maze Test patients receiving perphenazine showed the greatest degree of decrement, those given placebo showed least worsening, while chlorpromazine occupied an intermediate position.

All patients were assessed clinically by the nursing staff and occupational therapist daily during the trial, and by the psychiatrist before the start and at completion of medication. Results of these assessments are indicated in Table 4. They were made on the basis of observation for such manifestations as restlessness, anxiety, alertness, socialization, appearance, and degree of interest. Patients were categorized as improved (I), unimproved (U), or worse (W). In view of the many invalidities involved in this subjective manner of assessment, more subtle categorization was not attempted. The assessments were made independently.

There was a close correspondence of nursing and psychiatric assessment. Reports from the occupational therapy department agreed in all respects with nursing reports.

TABLE 1—SUMMARY OF RESULTS

	B Perphenazine		C Chlorpromazine		A Placebo	
	Mean Score at Initial Valuation	Mean Change	Mean Score at Initial Valuation	Mean Change	Mean Score at Initial Valuation	Mean Change
Rating	9.9	—4.9	11.3	—1.7	10.3	—1.1
Tapping	9.9	+3.3	7.1	+0.8	9.4	+1.0
Dotting	13.6	+4.0	11.3	+1.0	13.7	+0.5
Digit Symbol	11.1	+2.0	6.0	+0.3	11.8	—0.6
Maze	6.3	—0.3	4.0	—0.1	5.4	0
Digits Forward	4.5	+0.4	3.0	0	3.5	0
Digits Backward	1.6	+0.6	1.1	+0.1	1.4	+0.1
Average Age	42.5	(Min. 33) (Max. 54)	39.7	(Min. 20) (Max. 52)	43.2	(Min. 30) (Max. 54)
Average Duration of Hospitalization	13.3	(Min. 1) (Max. 29)	11.4	(Min. 1) (Max. 36)	13.3	(Min. 1) (Max. 31)

TABLE 2—SUMMARY OF STATISTICAL RESULTS

Analysis of Variance

	Source of Variation	Sum of Squares	d.f.	Mean Square
Rating Scale	Between	158.0	2	79.0
	Within	478.97	68	7.04
	Total	636.96		
	F = 79.0 / 7.0 = 11.3		Sig. at 1% point	
Tapping and Dotting	Between	611.07	2	305.54
	Within	4715.68	68	69.34
	Total	5326.75		
	F = 305.54 / 69.34 = 4.4		Sig. at 5% point	
Digit Symbol	Between	124.10	2	62.05
	Within	1416.13	68	20.82
	Total	1540.23		
	F = 62.05 / 20.82 = 2.9		Not significant	
Porteus Maze	Between	6.36	2	3.18
	Within	1320.01	68	19.41
	Total	1326.37		
	F = 3.18 / 19.41 = .16		Not significant	
Digit Span	Between	15.91	2	7.96
	Within	244.63	68	3.59
	Total	260.54		
	F = 7.96 / 3.59 = 2.2		Not significant	

TABLE 3

(t = Test)

Rating Scale		
Perphenazine-Placebo:		
t = 6.5 - 9.9 = 4.25		Sig. at 1% level
.8		
Chlorpromazine-Placebo:		
t = 9.3 - 9.9 = .93		Not significant
.64		
Tapping and Dotting		
Perphenazine-Placebo:		
t = 27.7 - 21.0 = 2.55		Sig. at 5% level
2.62		
Chlorpromazine-Placebo:		
t = 21.9 - 21.0 = .47		Not significant
1.89		

TABLE 4—CLINICAL ASSESSMENTS

Nursing	Perphenazine	Chlorpromazine	Placebo
Assessment:			
I	10	3	1
U	6	18	20
W	7	3	3
Psychiatrist			
Assessment:			
I	11	3	1
U	7	17	19
W	5	4	4

It will be seen that these subjective evaluations closely parallel the ratios obtained in the rating scales.

All those patients shown as worse in the perphenazine group were those who exhibited side effects. Worse patients in other groups were so categorized because of deterioration in behavior or mood.

In addition to the 75 patients originally included in the test, a further seven female patients were later added. These were not submitted to rating or any of the specific tests described. Perphenazine was given to four of them, and three received placebo. Dosage and duration of medication were the same as for the main group. These seven patients had been clinically very anxious or agitated and had been treated with large doses of up to 53,200 mg. of chlorpromazine during the preceding two months. The two youngest of the four receiving perphenazine showed clinical improvement in the spheres of decreased anxiety and agitation and increased accessibility, although one developed Parkinsonian signs. None of the three receiving placebo showed any change.

Laboratory investigations of urine and blood and alkaline phosphatase tests carried out at the start and completion of medication failed to show any abnormality in any patient.

Side effects occurred in five of the patients treated with perphenazine. These took the form of dizziness, nausea, tremors, Parkinsonian signs, slurring of speech, increased salivation, and markedly increased diaphoresis. One developed auricular fibrillation and then another exhibited a grossly swollen tongue seriously interfering with swallowing. The administration of medication was discontinued. On breaking the double-blind key at the completion of the trial, it was found that of the nine patients with side effects, one belonged to the smallest group of seven added later and not submitted to the testing procedures. This patient had been given perphenazine. Seven of the remainder belonged to the perphenazine group. These seven were assessed as clinically worse and all showed a deterioration in test performance. It is of considerable interest that the remaining patient who displayed side effects belonged to the placebo group. This patient showed marked Parkinsonian features and became very unsteady. These side effects appeared between the 7th and 18th days of the medication. Hypotension was not found.

Discussion and Conclusions

It is now established that the mesendiencephalic alerting system and associated areas have a profound influence upon the level of crude or basic consciousness, what might be called the general substratum or background of consciousness. These areas have a corresponding importance in the regulation of behavior. Gellhorn[12] has stressed the psychiatric implications of these facts. It is known that chlorpromazine in large doses stimulates part of this system and that such stimulation, however initiated, produces Parkinsonism. It may therefore be expected that a drug similar pharmacologically to chlorpromazine but with greater potency might produce similar results, pointing to a similar site of action in the reticular activating system. Parkinsonian features were produced in eight out of 29 patients receiving perphenazine in this study.

The study showed that patients receiving perphenazine tended to show greater improvement in the testing procedures than patients in the other groups. The tests given measured integrative function below the highest levels of purposiveness and abstraction, and yet above the lowest multi-neuronal reflex levels. It may be assumed that tapping and dotting are probably the tests which are least involved in cortical functioning, and are more closely allied to the function of the reticular formation. Maze tracing, digit symbol, and digit span are probably more closely associated with the usually accepted cortical functions of planning, learning, and recall.

Tapping and dotting showed the only statistically significant variation in actual performance. The source of variation was shown to be significant for perphenazine but not chlorpromazine, although the change in the latter was in the expected direction. Insofar as the other tests, which we assume measure higher-order function, did not show significant differences, it may be postulated that the site of action of the drug is at the subcortical level.

Maze results were not statistically significant but were in the expected direction, showing a decrement in performance. This phenomenon has been found following psychosurgery, notably topectomy of areas 9 and 10, and severance of thalamo-cortical connections to those areas. It seems probable therefore that the functions measured by the mazes are among those mediated by the reticular activating system.

The rating scale for anxiety also shows a statistically significant variation. The source of variation was shown to be significant for perphenazine but not for chlorpromazine. It is, of course, a different sort of measure than the performance tests, being a scale based on the examiner's rating which may have been subject to clues other than those that the scale purports to measure.

While it is not overlooked that statistical evaluations, although inescapable, do no more than indicate probability, it is nevertheless believed that the clinical and statistical evidence obtained in this study gives reasonable grounds to postulate that perphenazine and chlorpromazine both have their site of activity at the reticular formation. The function of these drugs therefore appears to be to modify crude consciousness or awareness. Their effects upon anxiety and their so-called "tranquilizing" effects are secondary and misleading.

The use of the term "tranquilizer" also has numerous undesirable sequelae, particularly since it has been adopted by the lay press. Not least amongst these sequelae is the indiscriminate use of these drugs by the public. It is suggested, therefore, that a more scientifically accurate and at the same time more desirable name might be "sciotic" drugs, meaning those drugs pertaining to basic awareness.

This study was undertaken not only because of its theoretical implications regarding the site of activity of perphenazine, and the wider implications which have not been remarked upon here, but it was also undertaken to assess the usefulness of the drug. To this end a double blind study using a placebo was carried out and has been described in detail. In this way adjuvants to therapy and extraneous factors were equalized as far as possible, since, of course, the effects of drugs are not necessarily a function of their pharmacological properties. The use of a placebo is itself open to numerous invalidities, particularly since few placebos are ideal in producing exactly the same side effects as the potent drugs being tested. Placebo effects can themselves be powerful, and the occurrence of Parkinsonian features in a patient receiving placebo in this study effectively illustrates this point. It is also true that the active drugs may themselves have placebo properties.

In spite of these difficulties, it is believed that the test of perphenazine reported here is a fair assessment of this new "sciotic" drug. It should be emphasized, however, that the continued use effects of the drug have not been measured, and that these findings constitute merely a preliminary report. No excuse is offered for the production of such a preliminary report, since all too often potent drugs appear on the market without the benefit of any assessment. At best, drugs are frequently prescribed on the basis of subjective impression only.

With these considerations in mind, perphenazine was found to be a useful drug of the same order as chlorpromazine, and with the same effects, but with a much improved therapeutic ratio. It may produce side effects similar to those of chlorpromazine, but it seems probable that side effects will be much less likely to occur with the use of smaller dosages than those used here. It may well be that this potent drug will replace chlorpromazine in the treatment of many agitated, anxious, or disturbed patients, particularly those who have failed to respond even to large doses of the latter drug. In such patients its effect will be through the reticular activating system to interfere with mediators of diffuse awareness, including vague and non-specific anxieties and tension.

Summary

A double blind study has been carried out on 75 chronic male and female patients, divided into three equal groups of 25. The three groups received perphenazine 16 mg. t.i.d., placebo 16 mg. t.i.d., and chlorpromazine 25 mg. t.i.d. respectively for 30 days.

Patients were rated and tested before and after the trial. In addition, laboratory investigations were made at those times and preliminary, daily, and final clinical assessments were made.

Additional seven female patients were given either perphenazine or placebo in the same dosage for the same period. These seven were not tested but all had failed previously to respond to large doses of chlorpromazine.

Statistical procedures included analysis of variance and *t* tests of significance. The Rating Scale for anxiety and the Tapping and Dotting tests were found to be significant at the 1% and 5% levels respectively for the perphenazine group. Digit Symbol, Porteus Maze and Digit Span did not show significant differences. The significance of these differences was discussed.

Rating, testing, and clinical assessment all showed perphenazine to be similar in its actions to chlorpromazine, but with the advantage of greater efficacy and of a much more favorable therapeutic ratio. Side effects similar to chlorpromazine were found, but it is thought would be less likely to occur in smaller dosage. Hypotension was not encountered.

The preliminary findings concluded that perphenazine is likely to prove a more than useful weapon in psychiatric practice, with indications for use, and with side effects similar to those of chlorpromazine, but with greater potency and improved therapeutic ratio.

Authors' Note: Trilafon is the trade name of the Schering Corporation, Ltd., of Montreal, Canada, for perphenazine (Schering Corporation, Bloomfield, N. J.)

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Non-Thrombocytopenic Purpura in Chlorpromazine Therapy

ROBIE T. CHILDERS, JR., M.D.

In view of the wide-spread use of Thorazine and its clinical importance, it is felt that any side reactions developed during its use merit discussion. The development of non-thrombocytopenic purpura in two cases is reported following administration of chlorpromazine. In the first case the patient had developed a clinical purpura on two successive occasions.

A second case is reported, following a shorter course of the drug. In this case there was, in addition to the purpura, a concomitant development of pruritus and swelling of the face.

One similar case is described in the literature:[1]

Case 1.—A 48-year old well-developed and well-nourished white female was first hospitalized in May 1954, with a history of episodes of depression occurring over a number of years. At this time she was diagnosed manic-depressive reaction, depressed type. There was no evidence in the history of any previous allergic phenomena. Her physical examination was essentially normal.

She subsequently improved and four months later was able to leave the hospital. Six and one-half months later she was readmitted with a recurrence of earlier symptoms. On the day of her second admission she was given two intramuscular doses of 50 mg. chlorpromazine and thereafter was continued on 150 mg. per day orally.

On the 25th day of treatment, after receiving a total of 3,700 mg. of the drug, patient showed evidence of clinical purpura and associated pruritus. The drug was discontinued and benadryl, 50 mg. four times a day, was given for three days. Benadryl was then replaced by Pyribenzamine, 50 mg. four times a day, for an additional two days. The rash subsided.

Thorazine was resumed two and one-half months later with an initial dosage of 75 mg. per day for three days and then increased to 200 mg. per day. This level of dosage was maintained uneventfully three months (total 18,450 mg. of chlorpromazine). At the end of this period patient showed a symmetrical purpura, distributed mainly over the front and sides of the feet, legs and lower thighs, with a few petechiae on both wrists. Physical examination was otherwise normal. The subjective complaints were limited to a mild pruritus. The drug was withdrawn.

A capillary resistance test (modification of the Rumpel-Leede test in which a sphygmomanometer was applied and the pressure maintained midway between the systolic and diastolic pressure for five minutes and the number of new petechiae counted in a circle 2.5 cm. in diameter) revealed 28 new petechiae.

Laboratory studies on the day of development of purpura were as follows: hemoglobin, 84%; total white blood cell count, 7,950 per c.mm. (segmented neutrophil 63%, lymphocytes 23%, monocytes 5%, eosinophils 9%); platelet count 515,284; prothrombin activity 78% (Quick's method); coagulation time was five minutes 40 seconds (McGowan's modification), bleeding time was three minutes 40 seconds (Duke's method). Clot retraction was excellent. The rash cleared gradually, no petechiae being present at the end of two weeks. Patient had ten total white blood cell counts and differential examinations in the three months prior to the development of purpura on the second occasion, and in none did the eosinophil count exceed 3% prior to the examination performed on the day of development of clinical purpura. The patient had received no other medication for two months prior to the development of the purpuric rash.

Case 2.—A 38-year old white female was first hospitalized in September 1955, with a diagnosis of psychoneurotic disorder, anxiety reaction. The patient received a total of 64 mg. reserpine between December 1 and December 13. Reserpine was discontinued on December 13. On December 14 the patient was put on 400 mg. chlorpromazine daily by mouth until December 24 (total of 4,200 mg. chlorpromazine). At this time the patient was noted to have a purpuric rash which was symmetrical in distribution over the front and sides of the feet, legs and lower thighs, with occasional petechiae scattered over the body. The face was edematous but no petechiae were present. No other clinical symptoms were observed and physical examination was otherwise negative. Chlorpromazine was withdrawn and the patient was placed on Pyribenzamine, 200 mg. daily. Three days later the purpura showed no alteration. The capillary resistance test revealed 35 new petechiae in a circle 2.5 cm. in diameter.

Laboratory tests performed the day following the appearance of the purpura showed the following: hemoglobin 89%; total white blood cell count 5,600 per c.mm. (67% segmented neutrophils, 23% lymphocytes, 5 monocytes, 1 basophil, 4 eosinophils); platelet count 444,000; coagulation time three minutes, 30 seconds (McGowan's modifica-

From Massillon State Hospital, Massillon, Ohio.

tion); bleeding time five minutes (Duke's method). The patient was placed on ascorbic acid, vitamin K and phenobarbital on December 27 and Pyribenzamine 200 mg. daily was continued. By December 30 the purpuric rash had almost completely cleared. On January 8, 1956 the repeat capillary resistance test was still positive but only 25 new petechiae were present. Laboratory studies on January 9 revealed the following: a total white blood cell count of 3,750 (60% segmented neutrophils, 34% lymphocytes, 6 monocytes); urinalysis was essentially negative; prothrombin activity 75% (Quick's method); thymol turbidity 8 units; cephalin flocculation negative at 24 and 48 hours. On January 10 a repeat capillary resistance test revealed a further decrease in the number of new petechiae to 17 in the prescribed circle.

Summary

Two cases of non-thrombocytopenic purpura are described following the administration of chlorpromazine hydrochloride in total dosages ranging from 3.7 Gm. to 18.4 Gm. over periods of from ten to ninety days before the onset of purpuric phenomena. Laboratory studies were negative without exception except for a moderate degree of eosinophilia occurring in the early phases of the purpura. On one occasion the purpura subsided spontaneously with withdrawal of the drug. In two separate instances antihistaminic preparations were administered. In all three instances the purpura disappeared in ten to 14 days. The capillary resistance test remained positive after laboratory and clinical evidences had disappeared. This test is suggested as of possible benefit in the detection of subclinical purpura that might occur during chlorpromazine hydrochloride therapy.

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"Like Charity, Mental Hygiene Begins At Home"

EDWARD E. MUELLER, R.S.W., MARIANO F. PIMENTEL, M.D., and JOSEPH MEIERS, M.D.

Self-knowledge is basic in knowing people. Penetrating insight enables us to deepen our understanding of those with whom we relate. Whether myopic, astigmatic or presbyopic, the world we never made is seen through our own eyes. As we relate ourselves to other people, the reaction we induce is not solely the reaction of the patient, but is the product also of what we inject and the impingement of our own personality. The patient's reaction is the composite interplay of two personalities—his own and that his therapist—each of whom is the product of a total life experience. A patient's reaction to a certain therapist is not that patient's reaction in general but is his reaction to that particular individual. The same patient may be outgoing with one therapist and constrained with another, secure with one, defensive with another, amenable, negativistic or hostile by turn in response to the therapist.

Since the therapist determines the patient's response, the therapist cannot hope to understand the patient until he understands himself. Without being vicarious, the therapist must see himself as others may see him and be fully aware of his own part in the patient's response. It is necessary that the therapist see himself as he, too, actually is, not only for a more adequate understanding of the patient, but in order that he may handle his own needs dealing with the tendency to project (and not accuse the patient of projecting when he himself is doing so) in such ways as to interfere as little as possible with the patient's full and complete expression.

While we like to think of the tendency to project as pathological in nature by reason of technical terminology, all of us, no matter how objective we may try to be, more or less unconsciously ascribe both pleasurable and unpleasurable emotions onto people and circumstances which are in reality totally unconnected with true causes. By projecting, the therapist may demand of others that which he demands of himself in the way of moral standards, achievements, modes of living, and the like. Because he himself has

certain values, he may try to impose these values onto others—fellow colleagues or patients—for whom such values are illogical and without reality. This is particularly true when the therapist belongs to a different race, religion, or cultural grouping.

Projection of self colors much of the work of the therapist but is particularly prone to occur in those who lack insight. It may also occur in a marked degree with those therapists who are in considerable conflict and whose personality difficulties have not been resolved to the extent that they are relatively free from conflict and have attained self-acceptance, which implies an acceptance of frustration and their own limitations as well as awareness of their own capacities. While it is realized that a certain degree of psychological distress in the therapist himself may prevent rigidity in working with patients, this is relative. Recognition of the tendency to project oneself into situations and to react to situations in terms of one's own personal experiences and personal needs often has influenced choice of profession as well as many aspects of one's work and entire philosophy.

Recognition of the subjective tendencies of those of us who observe necessitates full descriptive comment, not only what the patient or the patient's relatives said and did, but what the therapist, be he psychiatrist, clinical psychologist or psychiatric social worker, said and did in the interplay of patient or client and therapist. The invalid excuse given by various members of all disciplines is often that they are too busily engaged in actual treatment to be overly concerned with either form or content regarding recording. Only after a team member leaves the setting and his successor tries to understand previous recording is the value of clear notes brought home. "Wonder what he meant by that?" often becomes a catch question.

It is obvious, however, that even in verbatim recording we lose feeling tones of both individuals, since how the therapist said something, in terms of emotional response, may be more significant than what he said. Neither will any mode of recording entirely eliminate the possible subjective factor of selection. The therapist may note, select and record from the total situation in accordance with his own emotional needs, thereby defeating well-intentioned efforts to help individuals realize basic growth. As an example, when the mother of a young patient tearfully stated her devotion, it would have been careless to omit that the mother had placed her chair in such a position as to see her reflection in a huge wall mirror and from the beginning of the interview seemed to be boning up for an Academy Award as she tearfully described her maternal feelings toward her child.

Insofar as the therapist enables the patient to develop, he himself realizes growth. Because of the reciprocal nature of the relationship between therapist and patient, by frustrating the latter, the former interferes seriously with his own development. As the therapist projects his own unconscious wants and needs, he entangles himself in the patient, experiencing frustration and defeat which is inevitable when the patient is exposed to the ensnaring experience of being lived in and through another, rather than free to live his own life.

Closely related in the therapist-patient situation is the process of identification. Striving for empathy, we all identify in some measure with patients. Because we, as therapists, have experienced frustration, deprivation, despair, pain and unhappiness, we are enabled to put ourselves in the place of our fellow man, realizing, "There, but for the grace of God, go I." This capacity to identify may be regarded as the very core of altruism, since a therapist with but a meager capacity to identify would be handicapped in relating himself to patients with whom he is working. While essential in all human relationships, however, it sometimes occurs in excessive degrees in response to deep unconscious personal wants and needs of the therapist. In such instances, it can obstruct healthy relationships with patients. The therapist if expected to respond to unresolved emotional pressures while he himself is frustrated in his own urges and desires, and does not fully understand his own needs and urges, may unconsciously identify too closely with some patients.

What happens when a therapist identifies too closely and completely with a patient in

fulfillment of some unresolved need? The result is that the therapist ceases merely to feel with a patient and instead feels like him. This implies that the therapist may then react like the patient, throwing off all emotional pressures of his own unsatisfied feelings into fortifying and intensifying the patient's responses, the therapist then becoming the patient. If this occurs, the therapist has no means of helping the patient. Instead he is intensifying the patient's insecurity and needs, whatever these needs may be. A therapist who has led and is leading a meager, unsatisfying life, who is suffering from severe emotional deprivation, who has little security in any present relationships and who is feeling embittered and defeated, may feel so identical with the patient that he augments the patient's feelings of hostility and defeat and intensifies the patient's antagonism. Or—the therapist may find identity with the patient so painful, so unacceptable, because the patient's predicament and feeling reactions recreate and intensify his own life situation, that the therapist feels the need to reject the patient. In such situations, the therapist blocks the patient's expression of hostility, arguing with him in defense of the social order and through dominating measures negating the patient. This is particularly true in instances when the therapist comes from a minority group and works with a member of that same group. Such reactions might also mean inability to experience identification with the patient whose lot in life and whose feelings are as unacceptable to the therapist as the therapist's own. In such situations, the therapist is unable to help the patient handle his own feelings in such ways as to attain a more comfortable acceptance of his life situation.

Innumerable examples could be quoted. A therapist whose own childhood experiences had been unsatisfying, who had marked hostility toward over-authoritative parents and who still feels antagonistic toward them (and thereby to all parent figures in general) in addition to not getting along well in a working relationship with the clinic head, identified too closely with an adolescent boy whose foreign-born parents seemed over-authoritative in contrast to the parents of the boy's associates. Feeling completely at one with the boy and in opposition to the boy's parents, the therapist bent all efforts to have the parents give the boy more freedom. Fortified by the therapist, the youngster reacted with intensified hostility toward the parents, becoming more self-willed and disobedient. The stealing of an automobile, excessive use of alcohol and cigarettes, and finally the rape of a minor, resulted. Not sufficiently free of emotional needs to identify in any measure with the boy's parents or see the total situation except through the eyes of the boy, the therapist's chickens had come home to roost. Having been reared in an overly-protective environment and having experienced the domination of his parents, the patient had not been prepared to use the new freedom wisely nor was he able to cope with the released feelings of hostility toward his parents. Not only was the therapist unable to help the patient cope with these feelings, but the therapist was too emotionally involved to see that probably it would have been wiser to have helped the limitations of the parents as the first step in the process of gradual emancipation. Limited as the therapist was through his own non-acceptance of parent figures, it is obvious that only through emotional acceptance of all members of the family constellation could the therapist have helped various members of the household in their relationships with each other.

Acceptance of others implies acceptance of self. Therapists possessing self-knowledge in the true meaning of the term, not only understand, but accept themselves—with all shortcomings and long points—thereby being enabled to accept others because they do not have to fulfill their own limitations in others. Such a therapist has security within himself. He is either able to identify or to remain apart, free to relate himself to others and also to accept likenesses and differences.

Identification arising out of deep unresolved unconscious personal needs almost invariably obstructs healthy relationships. Healthy relationship between any two individuals implies a certain apartness in which the identity of each individual is maintained, not looked upon as an extension of another's

personality. The patient leans on the therapist to maintain his own identity, since in this may lie the patient's source of security. He identifies in accordance with his changing needs. The person who for the time being feels inadequate in meeting certain life situations, seeks not sameness, but difference, in the therapist, a difference not necessarily in culture, standards, or mores, but in feelings. The patient does not need to feel completely at one with someone whose feelings are identical to his own. To do so would not promote security in the patient. The patient needs to feel that the therapist is different in the sense of feeling different—that the therapist has a certain adequacy which he, the patient, for the time being lacks. In striving for adequacy, he identifies with the therapist who has adequacy. Often such patients purloin some of the therapist's attitudes, the therapist's mannerisms—and strive to meet situations as they believe the therapist would meet them. This is a growth of emotional dependency on the patient's part—an inevitable growth phase—which be either flattering or frightening or amusing to the therapist who does not understand the patient's needs or his own reactions. Because of this tendency on the part of the patient, it is triply essential that the therapist understand himself inasmuch as it is his therapeutic responsibility to direct the relationship, so that the patient's needs may be met by him without indulging his own identification needs. Unless he recognizes this the therapist may become emotionally entangled at this identification phase with resultant negative counter-transference.

Illustrative of the patient's desire for difference in the therapist is the following situation: A 14 year old boy was referred to the Clinic because of sexual delinquency which appeared to be of rapid onset and represented a radical personality change. Undersized, underweight, he had been guarded by an anxious mother because of prolonged illness following a cardiac involvement. Perhaps due to the fact that he was the only son and the youngest child whose father had died when he was an infant, the mother repeatedly emphasized that she had "tried to be both a mother and father to him." Four older sisters had contributed a great deal to the infantilization of the boy, coddling and dominating him. The mother did not permit him to associate with other children and forbade his indulging in any school sports. The boy began hero-worshipping an older boy, the school bully and the gang leader of the neighborhood. He found this identification very satisfying, not only because of his desire for assurance of masculine adequacy, but also because it probably gave him an outlet for repressed hostility which is so often accompanied by dependency in anti-social behavior.

When he was brought to the Clinic, he was quite remorseful. Accessible and responsive, he revealed phantasies about the father he had never known and a longing for a male parent figure. The therapist assigned to him was a physically frail individual, shy and passive, and somewhat dependent on his own mother, a deeply religious woman. Unable to accept the boy's delinquent behavior, the therapist stressed conformance, projecting his own ideals, standards and patterns onto the boy. His approach was like telling someone to take a cold shower if bothered by sexual urges or to carry sweets in one's pocket if inclined to drink excessively.

Such techniques were unacceptable to the boy since they typified precisely the kind of adjustment against which he had been reacting. The boy could not identify with the therapist; instead, he rejected him. As a result, he went to greater lengths in the enactment of his delinquency, regaling the therapist with details of his shocking behavior. Looking upon the behavior either as an expression of hostility toward the therapist or as a plea for acceptance of masculine aggressiveness, had the therapist been understanding and accepting, perhaps an identification could have been facilitated. As it was, the therapist could only further frustrate and intensify the boy's present needs for acting out in anti-social behavior.

Although in many instances the feelings of the patient are diluted and projections are not as distorted as in an orthodox psychoanalytic setting, there is a growing awareness that transference, even in shadowy

forms, (and therefore less clear and less comprehensive) is present in the Clinic settings. Just as in the analytic situation, this must be understood and accepted if the patient is to work out his own identity by gradually being freed from entangling and unfulfilled personal relationships which continually interfere with his social adaptation.

When a therapist meets unexpected hostility which seemingly is unrelated to the superficial circumstances in a situation, a feather attack giving rise to the wielding of a steel shield, it is well for the therapist to ask himself if he himself has been guilty of using a scythe to trim whiskers. This is equally true in dealing with patients or colleagues. Then the therapist should ask himself: "Who am I to this person? What am I to him? What is there about me that makes him react in such a manner toward me?" If the therapist is aware that hostility from either patient or colleague may not be necessarily directed toward him as a person, but toward him insofar as he symbolizes something else or someone else to the patient or the staff member, then the therapist may not be so prone to react defensively. Has he unconsciously become a threat to the other person? Has his area of competence eclipsed the area of competence of another discipline? Is he used as a displacement?

In some instances, staff members as well as patients readily need to experience a relationship which in no way recreates their own early life situations. There is, however, a possibility of intensifying social difficulties in so doing. In order to understand another person's use of him, the therapist needs to be well oriented as to his own part in the interplay of personality. If he is able to see and to understand what he himself has done or is doing to determine another's reaction, the therapist is enabled to withhold judgment and remain uninvolved emotionally. Therapy for other therapists is not implied, but understanding is needed to help others, whether colleagues or patients, to understand their own feeling responses. In addition to offering the other a unique relationship in the sense of making no emotional demands through which he can re-experience former frustrated relationships, the therapist should enable both patients and colleagues to bring their feelings to a conscious level through verbalization, the purpose of which is to clarify and objectify their relationships with each other. The therapist's effectiveness is determined by the nature of the relationships which he himself has experienced.

When one considers that conflicts and inhibitions of life are concerned largely with tangled and unfulfilled personal relationships, it seems inevitable that not only patients, but therapists themselves, bring to the therapeutic setting many unfulfilled needs. In considering the relationships involved in such a setting, we must include the early parental relationships of the therapist as well as those of the patient.

The nature, therefore, of the early parent-child relationship may determine a therapist's effectiveness. Many individuals, both therapists and patients, may feel they have been emancipated from parents because they live separately from them, are self-supporting, or because at some point in their lives they may have reacted against the parent. Sometimes, however, we confuse separation, self-maintenance and rejection of a parent with a gradual growing away from parental dependence. The former may leave one dependent and in need of reacting and reenacting parental identifications. The latter should leave one free to enact one's own identity. Many individuals, both therapists and patients, are actually not living their own lives, but are instead living an extension of the life of someone else—his or her subtle likes and dislikes, biases, prejudices, aspirations and traditional urges which are little understood because they are basically not actually their own. In the process of severance from the parent figure, they did not lose them, since separation did not necessarily imply growth, nor did growing older imply growing up.

A well integrated therapist, at peace with himself, carries on his own real interests and the real interests of others as well. Essentially he is the same whatever the circumstances or conditions. He is free and fundamentally honest with himself, his colleagues and with others. Since he believes the adage of loving one's neighbor as himself, he knows

he cannot give what he does not possess, and therefor he has a healthy love for himself which he does not jeopardize by performing unlovable acts. He is easily aware of his environment and reacts appropriately and with good judgment to it. Productive and active, he can call upon all of his resources, both inner and outer ones, to tackle whatever difficulties arise. Happy and enjoying life, his emotions are readily mobilized to spontaneous expression. Genuinely friendly and with a healthy curiosity and enthusiasm, he reserves his self-defense for such situations in which he himself or someone or something in which he really believes in is actually attacked.

It has repeatedly been said that many persons seek psychiatric fields of endeavor because of personal psychological distress. A therapist who has had relatively none may be likened to a teacher who has literally sailed through calculus with flying colors and cannot understand the pitfalls experienced by some of his students in fractions and decimals. A therapist, however, should accept his limitations, not be on the defensive. Formative years determine whether a person is adjusting well or not adjusting. It was then that the individual was subjected to emotional stress from parental and other environmental sources—not provided necessary affection, warmth and respect for his immature personality. Adverse influences deprived him of necessary factors for a strong, unified development. As a consequence, he felt insecure, unloved for himself, or held in disrespect. Responding to such influences, he adapted by protecting himself by measures which became elements in his character formation. One way in which a child responds under adverse conditions is to demand attention, believing he will never get anywhere or obtain anything unless he fights for it. As this pattern becomes a habit in subsequent years, be becomes chronically belligerent, egocentric, aggressive. His own rights, real or imagined, are paramount and he ignores legitimate rights of others and becomes exploitive and greedy for advantage. As a child, a dog bit him; he believes, therefore, that all dogs will bite him; if the dog does not bite, he pulls the dog's ears or tail until the dog in self-defense does bite. This would be the therapist who is a bully to other staff members or patients.

Another way in which a child may seek favor is to try to have himself liked, become compliant and obedient, to curry favor by seeking to please, avoiding self-assertion, developing a strong need for signs of approval, mistaking it for affection. More charming than sincere, such a person, if a therapist, sets up a most unrealistic "altruistic" ideal without wishing to be accused of self-glorification or self-interest, wishing to win a popularity contest. This would be the clinging vine of the clinic.

A third way in which a child might try to adjust to an unfavorable environment would be to avoid contact with others as much as possible, believing himself seated at a one-way glass, peering out of it, but wishing no one to peek in at him. Later, by withdrawing from people, by becoming aloof, and detached, he may give the impression of being objective in his thinking. He is typical of the therapist who is asked: "Listening to so many sordid, pitiful stories day after day, listening to so many heart-breaking tales, how do you keep so calm and unruffled?" and who answers: "Who listens?" In a clinic setting such a therapist is invaluable as the tabulator of statistics since he is interested more in form than in content.

It rarely occurs, however, that any one of the above trends develops without the admixture of others. While considered as somewhat eccentric in comparison to a well integrated therapist, such a person can function reasonably well if he genuinely accepts his limitations.

One poorly integrated staff member can create chaos in the entire clinic team. If supervising or directing others, his personal problems can extend effects even further, particularly so in an environmental situation where emotional tensions are constantly on the surface and there is a possibility of problems of patients being "rubbed off" on staff members.

Understanding oneself, particularly when doing therapy with others, gives not only oneself, but others—fellow staff members as well as patients served—a better chance not only to make a better living, but also a better life.

Proceedings of Eastern Psychiatric Research Association, Inc.*

DAVID J. IMPASTATO, M.D., *Presiding*

(The following accounts are summaries of full length reports read at the meeting of the Eastern Psychiatric Research Association.)

TUBEROUS SCLEROSIS (A Clinical-Pathological Presentation)

L. ROIZIN, M.D., D. DOUGLAS, M.D., G. GOLD, M.D., and H. BERMAN, M.D.

In 1880 Bourneville published a paper "Sclerose tubereuse des circonvolutions cerebrales: idiotie et epilepsie hemiplegique," which caused his name to be permanently associated with a disease entity which has been called Bourneville's disease or tuberous sclerosis. Subsequently the term epiloia was suggested.

In 1863 von Recklinghausen reported a case of "Hyperplastic tumors of the brain, associated with myoma of the heart." Virchow described a case in 1864 which presented tumors of the heart and subcutaneous nodules. Hartdegen, Bielschowsky, Schob, and recently, Globus have contributed a great deal to the present day knowledge of the disease.

Different theories are that tuberous sclerosis belongs in the group of (1) malformations (advocated by Globus), (2) neoplasms (Bielschowsky, Ferraro, and Doolittle), (3) neurocutaneous syndromes (Lichtenstein), and (4) hamartial disease (Minckler). The existence of such divergent opinions would indicate that its ultimate classification is still open.

According to Vogt organ development occurs in two successive stages. The first stage is the formative one and any interference at this point leads to massive malformations. Disturbances occurring in the second, or ontogenetic phase, lead to maldevelopments of lesser severity. On the basis of this, tuberous sclerosis could be regarded as a developmental disturbance occurring sometimes in the ontogenetic phase.

Globus considers that "Tuberous sclerosis is a disease in which malformation is the basic factor. The malformation, in turn, is the result of defective cell potencies. These defective capacities result in defective cell differentiation, and unrestrained prolifrative changes which, in certain instances, give rise to tumor formation."

Lichtenstein believes that "Tuberous sclerosis is a heredofamilial disorder and, like von Recklinghausen's disease, has protean manifestations in the nervous system, in the skin, and in many of the internal organs."

Clinical Findings: Tuberous sclerosis affects males and females alike. It is said to have familial and hereditary tendencies but this could not be elicited in our cases. Usually, the manifestations become obvious in early infancy. However, this is not necessarily so, as demonstrated by one of our cases in which the diagnosis was made in the fourth decade, essentially on the basis of X-ray findings.

The most typical clinical manifestations are (1) mental retardation, (2) epileptiform attacks, and (3) the prevalence of multiple tumors in one or more organs—the most obvious being the skin, the so-called adenoma sebaceum. Often, the predominant symptoms are epileptiform attacks. These are the most common findings and deviations are not infrequent. Also, instances occur when only one manifestation is obvious.

Generally epileptiform seizures constitute the first symptom of the disease, followed by psychic changes or some other evidence of mental deterioration. Few victims retain normal mentality. Other neurological manifestations are not prominent. In our cases, neurological findings were not impressive.

Cutaneous lesions are characteristic, the most frequent being the so-called "adenoma sebaceum," in addition to pedunculated skin polypi, subcutaneous nodules, and pigmented warts.

Laboratory Data: Blood (chemistry, hematology, and serology), as well as urine, are not remarkable. There are no changes in the spinal fluid.

Roentgenological examination frequently reveals intracranial calcification. It was present in four out of five of our cases.

In a review of the literature from 1940, we find that the consensus of opinion is that the majority of patients with tuberous sclerosis show some abnormality on EEG as was found in all our cases, and that there are no specific patterns characteristic of tuberous sclerosis, nor is it possible to localize the tuberous nodules in the brain.

Pathology: The characteristic lesions of the brain consist of tumor-like expansion of the gyri scattered irregularly throughout the brain. The nodular masses are most often found in the cortex but may also be seen in the subcortical areas, cerebellum, and brain stem. On cut section, the lines of demarcation between gray and white matter are abolished. At times, no gross aberrations are noted, but histologically, typical cell changes are present. These are the so-called abortive forms.

The adenoma sebaceum is composed mainly of connective tissue, capillaries, and contains but few glandular elements. Among other structures, the retina, kidney, thyroid, and frequently the heart show involvement. These involvements often consist of an embryonal type of tissue, and, at times, present no histological relatinoship to the central nervous system lesions.

Histological changes are pronounced, and at times are practically diagnostic. The appearance of the

*Meeting of June 13, 1957 at Willowbrook State School, Staten Island, New York.

giant cells and cellular "monstrosities" enables one to make a diagnosis with a fair degree of certainty. The neoplastic processes of tuberous sclerosis may assume glioblastomatous, spongioblastomatous, and ganglioneuroblastomatous character. Calcification is usually pronounced. The blood vessels generally show no pathologic alterations.

INFECTIOUS HEPATITIS (Experimental Passive-Active Immunity)

MILTON JACOBS, M.D.

Since 1953 more than 350 cases of hepatitis have occurred among the 4,000 mental defectives at the Willowbrook State School. Epidemiological evidence has suggested that it was infectious (not serum) hepatitis. The disease was mild and there were no deaths. Our studies were designed to attempt to answer two questions:

1. Would the administration of gamma globulin prevent the spread of hepatitis—and if prevention occurred would the effect be transitory—or would it be prolonged in such a way as to suggest the type of "passive-active" immunity as postulated by Stokes and his group.
2. Could "passive-active" immunity be induced experimentally in small isolated groups by the injection of gamma globulin followed by the feeding of hepatitis virus.

The number of cases of hepatitis in the institution were studied. In the middle of June 1956 the population was divided into a control group of almost 3,000, and 1,124 jatients were inoculated with gamma globulin 0.01 cc. per pound of body weight. In the 30 week period which followed 59 cases in the control group came down with hepatitis and jaundice, whereas, only nine cases in the gamma globulin were found.

In January 1957 the 3,000 controls were further divided into 1,182 patients who were inoculated with gamma globulin, with 0.06 cc. per pound of body weight, leaving a control group of 1,171. In the 20 weeks following this immunization, there were 20 cases in the new control group with hepatitis and jaundice, and only two cases in the inoculated group.

In order to answer our second question four further steps had to be carried out:

1. Preparation of a virus pool.
2. Titration of a virus pool for 50% infectivity dose.
3. Passive (G.G.) followed by active (virus) immunization.
4. Challenge for immunity.

The first group of eight was fed 1/100,000 of a gram of stool. None of the cases developed hepatitis. A second group of eight was fed 1/1,000 of a gram of stool and none of these developed hepatitis. The third group of eight were fed 1/10 of a gram and one case of hepatitis developed after 39 day incubation period. The fourth group was fed one gram of stool concentrate and four cases of hepatitis developed in from 39 to 49 days of incubation. The fifth group of five was fed two grams of the stool and three developed hepatitis in from 39 to 46 days of incubation, and the last group of 13 was fed four grams of stool and ten subjects developed hepatitis in from 42 to 58 days of incubation.

A trial of "passive-active" immunity was started in a group of 15 subjects, age 5 to 10 years, who were newly admitted to an isolation ward. Ten were given gamma globulin, 0.06 cc per pound of body weight followed by injection of active virus. Five received virus alone. Of the ten subjects receiving the combination of gamma globulin and virus, only one developed very mild hepatitis. In the control group, four of the five receiving virus alone came down with hepatitis. This group was challenged for immunity (ingestion of virus after an interval of three months. This study is still in progress.

The second question was concerned with attempts to induce "passive-active" immunity by simultaneously injecting gamma globulin and feeding virus containing material. Before proceeding with such trials it was important first to obtain some estimate of concentrations of virus to be used. The mildness of hepatitis at Willowbrook, especially in children, and its prevalence seemed to justify attempts to induce the disease artificially in small groups of isolated patients. Accordingly, a titration of virus in stool was carried out as follows: A 20% aqueous suspension was prepared from stools of six patienst in the first eight days of observed jaundice. Three centrifugations were carried out for one hour, one at 2,000 RPM and two at 8,500 RPM. The supernate was heated to 56°C for ½ hour and treated with penicillin 1,000 units and chloramphenicol 100 mg/ml. before sterility was achieved. This sterile suspension was inoculated into 5 monkeys (1 cc. intracerebrally), 47 suckling mice, Hela and monkey kidney tissue cultures. No changes occurred in any of these test objects and the monkeys' spinal cords and brain stems showed no evidence of poliomyelitis lesions.

The suspension was, therefore, deemed safe to feed, after permission was obtained, to groups of newly admitted children 3-10 years of age. They were admitted directly to and kept in separate isolation wards. They were cared for by attendants who had nothing to do with patients in the rest of the institution.

Acknowledgment: This research project is being conducted in collaboration with Drs. Robert Ward, Saul Krugman and Joan Giles of the Department of Pediatrics, New York University College of Medicine.

From Willowbrook State School.

ATARACTICS IN MENTAL DEFICIENCY

H. SCHILLER, M.D.

GENERAL REMARKS. This report deals with the empirical use of reserpine, chlorpromazine and a combination in 139 instances comprising 121 mentally retarded female patients.

In all patients sedatives were discontinued. In

patients with convulsive seizures, Dilantin and/or phenobarbital were continued.

The age range of subjects was from 5 to 55 years. The diagnosis in the majority of the cases was undifferentiated or familial. Other diagnoses were: epilepsy, birth trauma, congenital cerebral spastic infantile paraplegia, microcephaly, mongolism, phenylketonuria, meningitis, pertussis, gargoylism, congenital lues.

Dominant behavioral patterns were: assaultive, biter, self-abusive, destructive, quarrelsome, hyperactive, uncooperative and insolent. Many of the patients also were stubborn, broke windows, liked to be nude or had tantrums. This study was carried out over a period of a year and the data given are for that period. However, the results were reviewed again at the end of the second year of treatment.

Of the total members 38% on reserpine, 47% on chlorpromazine and 33% on combined treatment showed improvement in one or more of the following areas: became a ward worker or a better worker, sociability, cleaner and neater, better table manners, greater interest, talked better, began to talk, fed self, could attend O.T. or nursery class, could be returned to academic school class.

A significant number of patients developed tolerance but responded again to larger dosages of the ataractic. Some patients, however, developed resistance and lost all response to the drug.

RESERPINE was used in 55 patients, 20 idiots, 29 imbeciles and 6 morons; 43 patients were started with a course of 15 injections, usually 2.5 mg., over a period of 24 days, and 3 mg. orally in divided doses daily; 12 patients were started only on oral dosage of 2-3 mg. daily. The maximum given was 9 mg. daily. Maximum response was reached, in the injection group, in 2-3 weeks after drowsiness ceased, the extremes being 1-28 days. In the non-injection group the range was from 11-51 days; 34 patients were treated 4-11 months; 21 from 2-3 months. Typical reserpine minor reactions lasting several days appeared and did not require any dosage change. One patient showed a toxic confusional state which did not recur when treatment was resumed after being halted and she has shown marked improvement in her behavior now for 22 months. Parkinsonism occurred in 9 patients, between the 5th day and 16th week of treatment, and in 6 of these there was no recurrence when treatment was resumed.

CHLORPROMAZINE was used in 66 patients, 10 of whom were failures with reserpine. Of these 28 were idiots, 28 imbeciles, 10 morons. The dosage range was 50-600 mg. daily. Maximum response was reached in 7-14 days, the range being 2-45 days. Twenty patients were treated 4-7 months, 46 from 2-3 months. Only a few patients complained for several days of drowsiness, headache, abdominal pain or diarrhea. Two patients responded with marked excitation. Parkinsonism occurred in 3 patients. An intense desire to get under the shower occurred in 5 patients.

COMBINED RESERPINE-CHLORPROMAZINE was tried from 1-3½ months on 18 patients who had failed to respond to either ataractic alone. There were 8 idiots, 8 imbeciles and 2 morons. The dosage range was from 2 mg. and 50 mg. to 8 mg. and 800 respectively of reserpine and chlorpromazine. It took 1-12 days to obtain maximum effect. One patient developed facial edema. Parkinsonism occurred in 1 patient. One patient showed toxic confusion, tonic spasms leading to opisthotonus with no loss of consciousness and no change in tendon reflexes. Treatment was discontinued and all symptoms disappeared after 8 hours.

MENTAL LEVEL AND PERCENT FAILURES. Idiot and low-grade imbeciles—47% failed on reserpine, 25% on chlorpromazine, 14% on combined treatment. Imbecile—31% failed on reserpine, 13% on chlorpromazine, 100% (2 cases) on combined treatment. Moron—17% (of 6 patients) on reserpine, 10% (of 10 patients) on chlorpromazine, and neither of the two morons on combined treatment were helped. It should be mentioned here that in the 2 year review, there was 30% failure in 30 morons on chlorpromazine.

Percent Comparison of 1st Year and 2nd Year Results

RESERPINE (55 patients)—56% vs. 30% markedly improved; 6% vs. 7% moderately improved; 0% vs. 3% slightly improved; 38% vs. 60% failure.

CHLORPROMAZINE (66 patients; 78 patients) 50% vs. 19% markedly improved; 18% vs. 23% moderately improved; 12% vs. 24% slightly improved; 20% vs. 34% failure.

COMBINED TREATMENT (18 patients; 19 patients) 39% vs. 5% markedly improved; 6% vs. 15% moderately improved; 33% vs. 21% slightly improved; 22% vs. 59% failure.

CONCLUSIONS

1. Age, weight, diagnosis, mental level and behavioral patterns did not seem to be factors in dosage, minor reactions, or Parkinsonism reaction. Nor is it certain that mental level plays a role in results.

2. It is important that dosage be sufficiently large and individualized.

3. Some patients show a paradoxical effect of excitation.

4. The longer treatment is continued, the more patients will develop resistance to the ataractic.

5. Despite drug resistance and failures, these ataractics have been of great value in making ward management easier, in producing a quieter and more relaxed atmosphere for other patients, and especially in helping the behavior problem patients to progress in their development and show improved social attitudes.

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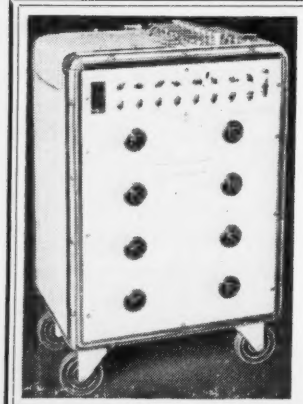

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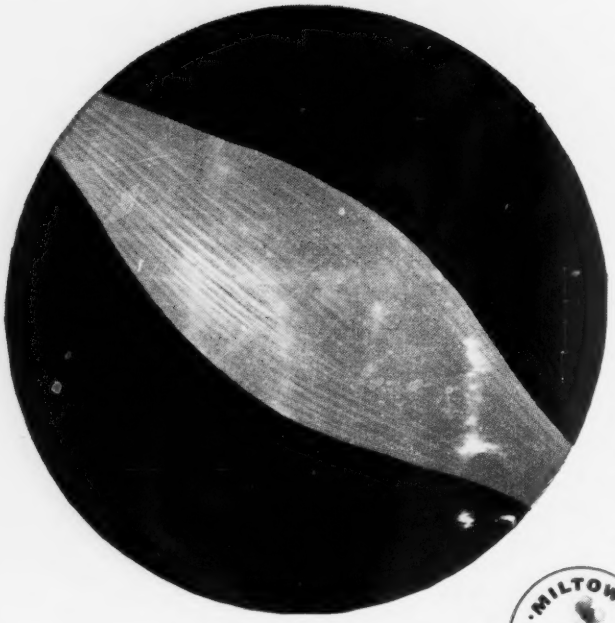

Miltown®

tranquilizer with muscle-relaxant action

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent 2,724,720

Supplied: 400 mg. scored tablets
200 mg. sugar-coated tablets

Usual dosage: One or two 400 mg. tablets t.i.d.

Literature and samples available on request

WALLACE LABORATORIES, *New Brunswick, N. J.*

MILTOWN® THE ORIGINAL MEPROBAMATE®

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CM-5108